

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : RIPPL
Serial No. : 10/565,332
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For : PROCESS AND DEVICE...
Art Unit : 4118
Examiner : NGUYEN, Hung D
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Commissioner for Patents
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PRE-APPEAL BRIEF REQUEST FOR REVIEW

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.

This request is being filed with a notice of appeal. The review is requested for the reasons as follows:

Claims 1-3, 6-7, 10-15, 17-18 and 21-22 stand rejected under 35 U.S.C. 102(b) as being anticipated by Coulter (US Pat. 4,578,554). The rejection takes the position that Coulter teaches all of the claimed features including the process of moving the laser tool along a predetermined path along the workpiece by a displacing motion of the manipulator and during the displacing motion of the manipulator superimposing a compensating motion of the laser beam to the displacing motion during the displacing motion. The compensating motion is at least partially oppositely directed to the displacing motion (claim 1). With the device (claim 14) motion is controlled and includes superimposing the at least partially oppositely directed compensating motion of the laser beam to the displacing motion during the machining operation.

Coulter fails to disclose the process steps and fails to disclose the device with the control for superimposing an oppositely directed compensation motion of the laser beam to the displacing motion during machining operations. A review of Coulter indicates that the arrangement proposes the use of an optional probe member 78 to program the robot for automatic operation of the welding head. The probe member 78 is mounted such that it projects less than the focused laser beam 46. The probe member 78 is manipulated along the surface of the workpiece such that the welding head follows the desired cutting line and remains normal to the working surface of the workpiece 14. During this motion the minicomputer 34 is activated for sensing the transient positions of the welding head and for recording those positions for subsequent recall to automatically duplicate the programming motion of the welding heads 16. With this arrangement, the eventual machining step will maintain the laser beam such that it is directed normal to the surface with the welding head being closely spaced based on a short focal distance. This does not in any way teach the feature for which the reference is cited. Maintaining the welding head normal to the workpiece will not superimpose a compensating motion to the displacing motion with the compensating motion being at least partially oppositely directed to the displacing motion. The Coulter reference only teaches maintaining the welding heads 16 normal to and near the workpiece.

Coulter does not teach the feature for which it is cited. The prior art fails to teach one or more essential element needed for a *prima facie* rejection. Accordingly, it is requested that the rejections based on Coulter be withdrawn.

The invention provides a solution to problems which occur, particularly with regard to non-continuous seam welds, sometimes known as stitches. Such interrupted welding regions can cause problems with regard to the acceleration or deceleration of the manipulator. The invention provides a displacement motion of the manipulator (for example a six axis multiaxial robot) that

can be increased with regard to speed while still dealing with a complicated welding paths including such stitches. Acceleration or deceleration of the manipulator is avoided as well as issues with regard to inertia (given the large mass of a six axis multiaxial manipulator). Stress on the manipulator is significantly lowered where the displacing motion is essentially continuous. The laser beam position is controlled, during the displacing motion, to include movement with a direction opposite to the direction of the displacing motion. With the oppositely directed motion, the weld can be formed at a lower welding speed, as compared to the speed of the displacing motion. Further, so-called stitches can be formed relatively rapidly. The compensating motion is preferably performed by means of a pivoting motion of the manipulator hand (robot hand) about one of the hand axes. This type of motion can be carried out rapidly and controlled very accurately. The hand axis is preferably independent and can be controlled independently from the displacing motion of the manipulator axes. The motion of the hand axes, especially along the axis located far away from the driven side, allows the advantage that the masses involved are quite low, which permits a low-inertia compensating motion.

The obviousness rejections based on Coulter do not establish a *prima facie* case of obviousness. As noted above, Coulter does not teach the feature for which it is cited. Further, the secondary references present significantly different concepts such that the teachings cannot be combined in an obvious manner and do not result in the features claimed.

The rejection of claim 19 is based on the teachings of Coulter (US Pat. 4,578,554) in view of Goutines (JP 7-256478).

Goutines teaches an arrangement with a longer focal length. As such a significantly different type of focus head must be used. Coulter discloses an arrangement with a very short focal length corresponding to probe member 78. The teachings and concepts of Goutines are not

combinable without a significant departure from one of the two arrangements. The prior art fails to teach one or more essential element needed for a *prima facie* rejection. The proposed combination of teachings is not obvious. Accordingly, it is requested that the rejection of claim 19 based on Coulter in view of Goutines be withdrawn.

The rejection of Claims 4, 5, 9 and 20 is based on the teachings of Coulter (US Pat. 4,578,554) in view of Maruyama et al. (US Pat. 6,072,149).

An essential feature of the invention is again missing from the teachings of the prior art (Coulter). Further, the proposed combination is based on combining features which are quite different and incompatible, absent further teachings and suggestions to deal with the problems created by the proposed combination. Maruyama et al. does not use a robot and instead has a fixed welding head. One turning axis is provided (figure 3) and rotated only for orientation. There is no rotation for welding (column 4, lines 43 – 50). Two mirrors can turn to deflect the laser. The laser is directed only by mirrors and there is no alteration as to velocity. The proposed combination based on these very different teachings would not be obvious. The references do not suggest the combination claimed. Accordingly, it is requested that the rejection of claim 4, 5, 9 and 20 based on Coulter in view of Maruyama et al. be withdrawn.

The rejection of claims 8 and 16 is based on the teachings of Coulter (US Pat. 4,578,554) in view of Moran (US Pat. 4,798,321). An essential feature of the invention is again missing from the teachings of the prior art (Coulter). Further, the proposed combination is based on combining features which are quite different and incompatible. With the invention, the tool may also be mounted by means of an extension arm as described. With an extension arm a distance is provided such that small angles of rotation of the hand axes are sufficient to obtain great compensating motions and compensation paths of the laser. The transmission ratio or the leverage applied can

be changed by changing this distance. Moran discloses a type of robot that turns around an axis 46 at the end of a construction clamp. This type of axis orientation does not combine well with the arrangement taught by Coulter. The extension arm of Moran involves a cable for the laser. This cable precludes multiaxial movements of the laser head, based on the cable being in the way, or restricting the motions. The references do not suggest the combination as claimed. Accordingly, it is requested that the rejection of claim 4, 5, 9 and 20 based on Coulter in view of Moran be withdrawn.

Respectfully submitted
for Applicant(s),



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IS HEREBY REQUESTED TO CHARGE SUCH FEE TO OUR DEPOSIT ACCOUNT 13-0410.